

Econ 4905

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Extra Credit Paper: The Basics of Mortgage Backed Securities

When one thinks of mortgage backed securities (MBS), the first thing that probably comes to mind is the financial crisis of 2008 that rocked Wall Street and global markets. This essay will not center on the crisis, however, it is important to first set up why the securitized products market failed in 2008 before delving into the technical aspects of the product itself. This essay will explore what the securitization process is, what non-agency securities are compared to agency securities, and what makes investing in mortgage backed securities different from investing in other spread-based markets such as credit.

The 2008 MBS Bubble

Around ten years ago, MBS gained a notoriety in financial markets as is ignited the onset of the collapse of Lehman Brothers and almost the entire financial market. Today in 2018, we are just seeing signs of recovery. So, what happened? In short, the market developed a higher aptitude for risk in an economy where inflation was low and there was stable growth. In the years leading up to the mortgage bubble explosion, this irresponsible risk taking was prevalent in mortgage lending: there were many borrowers who did not understand the terms of the loan as well as an accumulation of loans given that had values that exceeded the actual value of the home itself. In *The Economist's* crash course of the financial crisis, they describe this phenomenon as the following: "Loans were doled out to "subprime" borrowers with poor credit histories who

struggled to repay them. These risky mortgages were passed on to financial engineers at the big banks, who turned them into supposedly low-risk securities by putting large numbers of them together in pools.”¹ The idea behind “pooling” was that it provided a diversification of mortgages which would allow for the rise of one city’s housing market in the pool to offset the fall of another in the pool. This ideology was shattered when at the start of 2006, the whole nation suffered a downward spiral in the prices of homes. What further escalated this issue of poor lending and underwriting were the securities that pooled mortgages were tied to: collateralized debt obligations (CDOs). CDOs gained attraction leading up to 2008 which was evident in the tenfold increase in investing from \$30 billion in 2003 to \$225 billion in 2006: it is CDOs that became “the big short” in the 2008 crisis with the creation of the credit default swaps market as Michael Lewis famously speaks to in his book *The Big Short*. Like any other credit product, CDOs were broken into tranches by levels of risk exposure. Those who were seeking low risk and higher returns than treasuries, in a low interest rate environment, were buyers of top of the stack securities (AAAs predominantly). What these investors didn't know is that what they were buying had much more risk than advertised due to the careless lending, mentioned earlier, coupled with the corruption of rating agencies who weren’t reluctant to give high ratings amidst their growing conflicts of interest. The “safe” CDOs became worthless which spawned a fire-sale of assets as these securities became marked to market. Following the moral dilemmas Americans faced seeing their tax-paying dollars being put to work by bailing out banks, our government knew a change had to happen to prevent this in the future. The Dodd-Frank Act became the most extensive revision of US financial regulation since the 1930s; it was followed up with updates to

¹ The Economist, “The Origins of the Financial Crisis Crash Course”

Basel II among many other initiatives to repair global markets. With that history in mind, what are securitized products today?

What is Securitization?

Securitization is the process of pooling individual loans and converting them to security packages. Mortgage lenders choose to securitize to gain balance sheet liquidity, acquire regulatory capital relief, and lower the cost of financing. Investors see MBS as attractive because of the higher yield over treasuries, relative liquidity, and limited risk. When a MBS security is issued, it is labeled by an original balance and a few weighted averaged values of the securities in the pool: WAM (weighted average maturity), WAC (weighted average coupon), FICO, LTV (loan-to-value), and WALA (weighted average loan). These values are used as mechanisms to describe a pool of non-identical loans to investors. In addition, MBS securities can be categorized into fixed rates, floating rates (such as ARMs), or hybrids (such as 5/1s that are fixed bonds for five years and then undergo a rate reset every year after). The cashflows generated from these pools are received by a trust and that trust distributes them to investors monthly.

“Most residential mortgages in the United States are securitized, rather than held as whole loans by the original lender. Securitized loans are pooled in a separate legal trust, which then issues the MBS and passes on mortgage payments to the MBS investors, after deducting mortgage servicing fees and other expenses.”² At a basic level, all securitized products fit the descriptions of the above criteria. It begins to be more complicated when examining the different structures of MBS which include: agency MBS (basic passthroughs and CMOs), Commercial Mortgage Backed Securities (CMBS), Asset Backed Securities (ABS), and Non-Agency (RMBS). The

² Federal Reserve Bank of New York, “TBA Trading and Liquidity in the Agency MBS Market”, p.2

primary two branches in MBS are agency and non-agency collateral. In addition to agency and non-agency securities, we also have CMBS and ABS with CMBS including loans for hotels, malls, and other commercial facilities and ABS including student loans, car loans, credit card loans, and much more. Here, I will just be focusing on agency versus non-agency as they make up the bulk of the securitized products market.

Agency MBS

Agency MBS have underlying collateral that are implicitly guaranteed by the government through one of the government-sponsored entities (GSEs) which are Fannie Mae (FNMA), Freddie Mac (FHLMC), and Ginnie Mae (GNMA). These institutions serve the purpose of issuing and guaranteeing pools of mortgages. Fannie Mae was founded in 1938 to provide liquidity via a secondary market to the mortgage market. Ginnie Mae split off from Fannie Mae in 1968 for the purpose of insuring FHA/VA loans. Freddie Mac came into the picture in 1970 as a competitor to Fannie Mae. Fannie Mae and Freddie Mac purchase mortgages for their own portfolios alongside the Federal Government who just began to taper its bond purchases back in 2013 as strength appeared to be re-established in the mortgage market post-2008. Agency MBS has an implicit guarantee (except for GNMA which has the full faith and credit of the US government since its issuance includes VA loans) because the US government doesn't back FNMA and FHLMC with "full faith." However, it is highly unlikely that the government would let FNMA and FHLMC fail (only in the case of the government failing itself would we see FNMA and FHLMC go under). In the market, this "implicit guarantee" is priced in with agency debt trading tighter to treasuries than non-agency debt. The most liquid market in the agency space is the TBA market. "The vast majority of agency MBS trading occurs in this forward

market, which is known as the TBA market (TBA stands for “to be announced”).”³ In a TBA trade, the seller of MBS agrees on a sale price, but does not specify which securities will be delivered to the buyer on settlement day. The TBA market is set up such that investors only know the coupon, the originator, and the settle date. On the roll date, a position is to be “rolled” or the buyer takes delivery: “No later than 3 p.m. two business days prior to settlement (“48-hour day”), the seller provides the buyer with the identity of the pools it intends to deliver on settlement day.”⁴ The pools delivered through the TBA passthrough market are designed to be “the worst to deliver” as originators would rather give up their worst pools that meet the criteria of the coupon and maturity than their best. In relation to this idea, the Federal Reserve Bank Report entitled “TBA Trading and Liquidity in the Agency MBS Market” explains that the pricing reflects the fact that “this is an example of a widespread market phenomenon known to economists as adverse selection.” A specific pool vintage can be traded as well, but at a premium to TBA because adverse selection is limited: buyers of specific pool vintages know more characteristics of their pools than a TBA investor would. These kinds of securities are called spec pools because the mortgages within these pools all have a similar attribute that the investor can be made aware of such as loan balance or high LTV (loan-to-value). This removes some of the uncertainty in the quality of the pool the investor will receive. It also allows for investors to isolate certain variables that are affected by rate changes. For example, one could buy a low loan balance pool when rates are expected to decrease because these pools will not develop the same increases in prepayment speeds that the coupon-equivalent TBA pool would. Additional structures in agency markets include CMOs such as sequentials or PACs.

³ Federal Reserve Bank of New York, “TBA Trading and Liquidity in the Agency MBS Market”, p.7

⁴ Federal Reserve Bank of New York, “TBA Trading and Liquidity in the Agency MBS Market”, p.8

Non-Agency MBS

Non-agency securities don't obtain the implicit government guarantee that agency MBS do because they can be identified by a non-conforming characteristic such as the loan's size ("jumbo loans") since Fannie Mae and Freddie Mac can't buy loans above a certain threshold, the loan purpose (e.g. second properties), or the loan's poor credit (e.g. Subprime loans, Re-performing loans, Credit Risk Transfers/CRT, Whole Loans, or "Legacy Bonds" issued prior to 2008 and still are outstanding). "Non-agency collateral is called whole loans before they are securitized."⁵ These loans can either be sold as whole loans in the non-agency market or securitized into structures such as non-agency CMOs. To achieve high ratings in non-agency without the government guarantee agency has, non-agency bonds' structure includes significant credit enhancement that acts as a buffer to credit events and decreases investors fears of losses: the lowest rated tranches take credit losses first and the most senior only get hit with credit losses if all those tranches under it are wiped out. Additionally, new regulations require issuers to have "skin in the game" by taking a piece of the risk whether that be a horizontal or vertical slice of the structure. Despite the inherit credit risk non-agency securities carry relative to agency securities, Barron's notes in its article "Finding the Upside in Non-Agency MBS" that they, "offer an attractive yield with less sensitivity to rising interest rates." RMBS markets are more impacted by consumer trends therefore they benefit greatly from rising home prices and a strengthening economy.

Risks that Differentiate MBS from other Spread Markets

⁵ Goldman Sachs, "A Mortgage Product Primer"

Given the many different structures and sectors in securitized products, what risks do they all share that are not present in other bond markets? At the core, the answer is how MBS react to changes in rates. MBS have negative convexity: when interest rates fall, the price increase of the bond is less than how much the bond price would decrease for a same move up in interest rates. Why? Prepayment and Refinancing Risks. “Mortgagors have the right to reduce principal ahead of schedule, which is called a prepayment option.”⁶ One may prepay to relocate to a new home, in the case of defaults, or to refinance into a new mortgage. Refinancing occurs when interest rates fall lower than the rate one locked in their mortgage at: someone would only pick to refinance if the amount of money they would save, if they refinanced to a lower rate, is greater than the fees associated with refinancing. This is why it is more likely that those with very high loan balances or fairly new mortgages refinance. Refinancing and prepayments would be the call risk imbedded in MBS. If call risk occurs, “This benefits the holder of a discount MBS (i.e., the holder bought the MBS for less than face principal value – below par), as principal purchased below par is returned early at par,” and hurts the holder of a premium MBS.⁷ In addition to the call risk associated with MBS, there is extension risk. “Extension risk occurs when monthly cash flows are slower than expected and hence the weighted average life of the bond is extended.”⁸ This may occur in rising rate environments as mortgage holders could put their excess money into investments to earn a return rather than paying off their mortgage early. Extension risk also is seen in relation to “burnouts” where more seasoned pools exhibit slower prepayment speeds. Together, extension and call risk create the negative convexity of MBS not attributable to other spread markets where if rates changed by the same amount in different directions, the absolute

⁶ Goldman Sachs, “A Mortgage Product Primer”

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value of the price change should be the same. MBS not only is impacted by credit risks but also interest rate changes.

Conclusion

Since the recession in 2008, the MBS have shown much growth. This was a brief introduction to a product that possesses much complexity in its structure and in its risks. Here, this paper served to contextualize MBS in the wake of the financial crisis and outline the agency and non-agency markets we see today. Despite the steep learning curve inherent in this market, investors have flocked to it making the MBS market one of the most liquid markets behind treasuries.⁹

Regulations have been implemented sternly by originators and this has eased the risks in the MBS market allowing for the creation of securitized products structures not seen before. As long as the rules installed post-2008 remain at the forefront of underwriters and originators' procedures, this market should continue to see growth.

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